Pain assessment and training: the impact on pain control after cardiac surgery*

TREINAMENTO E AVALIAÇÃO SISTEMATIZADA DA DOR: IMPACTO NO CONTROLE DA DOR DO PÓS-OPERATÓRIO DE CIRURGIA CARDÍACA

ENTRENAMIENTO Y EVALUACIÓN SISTEMATIZADA DEL DOLOR: IMPACTO EN EL CONTROL DEL DOLOR POSTOPERATORIO DE CIRUGÍA CARDÍACA

Magda Aparecida dos Santos Silva[1], Cibele Andrucioli de Mattos Pimenta[2], Diná de Almeida Lopes Monteiro da Cruz[3]

ABSTRACT

We analyzed the effects of training and the application of a form for systematized pain assessment of pain control after cardiac surgery on pain intensity and supplementary morphine use. Three patient groups underwent a non-randomized clinical trial with standardized analgesic prescriptions. In Group I, the nursing staff did not receive specific training regarding pain assessment and management, and patients were treated following the established protocol of the institution. In Groups II and III, the nursing staff received targeted training. In Group II the nursing staff used a form for systematized pain assessment, which was not used in Group III. Group II presented a lower intensity of pain and greater consumption of supplementary morphine compared to Groups I and II. Training associated with the systematized assessment form increased the chance of identifying pain and influenced nurses' decision-making process, thus promoting pain relief among patients.

DESCRIPTORS

Thoracic surgery
Pain, postoperative
Pain measurement
Analgesia
Education
Nursing care

RESUMO

Neste estudo analisou-se o efeito do Treinamento e uso de Ficha de Avaliação Sistematizada para controle da dor após cirurgia cardíaca, sobre a intensidade da dor e o consumo de morfina suplementar. Três grupos de pacientes foram submetidos a um ensaio clínico não randomizado com prescrição analgésica padronizada. No Grupo I, a equipe de enfermagem não recebeu treinamento sobre avaliação e manejo da dor e cuidou dos doentes conforme a rotina da instituição. Nos grupos II e III, toda a equipe foi treinada. A equipe de enfermagem do grupo II utilizou a Ficha Sistematizada sobre Dor, e a do grupo III não a utilizou. O grupo II apresentou dor menos intensa e maior uso de morfina suplementar. O treinamento associado à Ficha de Avaliação aumentou a chance de identificar a dor e influenciou o processo de decisão do enfermeiro na administração de morfina, favorecendo o alívio da dor dos pacientes.

DESCRITORES

Cirurgia torácica
Dor pós-operatória
Medição da dor
Analgesia
Educação
Cuidados de enfermagem

RESUMEN

Se analizó el efecto del Entrenamiento y uso de Ficha de Evaluación Sistematizada para control del dolor posterior a cirugía cardíaca, sobre la intensidad del dolor y consumo de morfina suplementaria. Tres grupos de pacientes fueron sometidos a ensayo clínico no randomizado, con prescripción analgésica estandarizada. En Grupo I, el equipo de enfermería no recibió entrenamiento sobre evaluación y manejo del dolor, y cuidó a los pacientes conforme las rutinas institucionales. En Grupos II y III, todo el equipo recibió entrenamiento. El Grupo II utilizó la Ficha Sistematizada sobre Dolor, el Grupo III no la utilizó. El Grupo II presentó dolor menos intenso y mayor uso de morfina suplementaria. El entrenamiento asociado a la Ficha de Evaluación aumentó la chance de identificar el dolor e influyó en el proceso decisorio del enfermero en la administración de morfina, favoreciendo el alivio del dolor de los pacientes.

DESCRIPTORES

Cirugía torácica
Dolor postoperatorio
Dimensión del dolor
Analgesia
Educación
Atención de enfermería

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[1] Master Degree in Nursing, School of Nursing, University of São Paulo. São Paulo, SP, Brazil. magdasilva@usp.br [2] Full Professor, Department of Medical-Surgical Nursing , School of Nursing, University of São Paulo. São Paulo, SP, Brazil. parpca@usp.br [3] Full Professor, Department of Medical-Surgical Nursing , School of Nursing, University of São Paulo. São Paulo, SP, Brazil. Dean of the School of Nursing, University of São Paulo. dinamcruz@usp.br

Português / Inglês
www.scielo.br/reeusp

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INTRODUCTION

Pain stands out as a relevant source of stress in critically ill patients. Actions toward improving pain assessment and treatment have not been sufficiently studied. Nurses play an important role in the decision-making process for employing supplementary analgesia and can influence pain control standards[1-4].

Nurses assess and record patients' pain intensity on a daily basis, and often, despite the availability of strategies[2], nurses do not adjust analgesia or administer the prescribed medication as qualified on an *as needed* basis [5-7]. The apprehension of health professionals in administering opioids has also been known for decades[5-6,8].

Educational programs are capable of improving healthcare professionals' practices. The effects of educational interventions on pain assessment and control, as well as on fear of patient addiction have already been tested in nurses, doctors and pharmacists[9]. A decrease in the fear of addiction to administered opioids and more personalized medical prescriptions were observed[9]. Another study on this issue showed an improvement in the communication status among patients, the nursing team and the medical team; the same study indicated that the patients cared for by nurses who took part in educational interventions had their pain addressed more comprehensively[10]. On the other hand, these studies did not assess the impact of these programs on patients' pain intensity.

The effects of educational programs are quite restricted when adequate analgesic protocols are not available. When the use of a pain rating scale was encouraged, it was observed that the educational program assisted in improving pain records but promoted only a slight alleviation of pain intensity, due to the lack of an adequate analgesic protocol[11]. In addition to the involvement of other professionals, the authors suggested the adoption of pain assessment and treatment protocols[11].

The involvement of the nurse in the multiprofessional process of pain and sedation assessment seems to improve critically ill patients' care. Systematized pain and agitation assessments, associated with the education of the medical team regarding analgesia and sedation, resulted in the reduction of pain and intensity of agitation in patients[12]. Pain control requires the combined use of an educational program, systematized assessment and adequate analgesia protocols. The present study tested the hypothesis that training and a systematized pain assessment provides nurses with decision-making support concerning the administration of morphine and the consequent pain relief of patients. The goal was to assess the effect of a training intervention and the application of the Systematized Assessment Form (SAF) for pain control after cardiac surgery, as well as pain intensity and patients' supplementary morphine consumption.

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METHODS

A non-randomized clinical trial was carried out to test the effects of two interventions on pain intensity and *as needed* morphine consumption for six time points throughout the first 30 hours following extubation of post-operative cardiac surgery patients. Interventions were comprised of the application of a specific training program to all nurses in the Intensive Care Unit (ICU) and the implementation of a SAF for pain, aimed at recording pain intensity.

Three groups of patients were assessed: the first group was assessed prior to the interventions (GI); the second group was assessed after the two interventions (GII); and the third group (GIII) was assessed after removal of the SAF for pain (Figure 1).

To create similar conditions for all three groups, a pre-operative patient education stage, standardization of drug therapy and nursing staff training were performed. The study was carried out in the surgical ICU of a public hospital, an educational reference for cardiovascular surgeries in São Paulo, Brazil. The research was assessed by the Scientific Commission of the Heart Institute of the University of São Paulo (*Instituto do Coração da Faculdade da Medicina da Universidade de São Paulo* - InCor-HC.FMUSP) and approved by the Research Ethics Committee of the HC.FMUSP Clinical Board under review number 1224/05.

To create each one of the groups, all admitted patients undergoing elective cardiac surgery were invited to participate in the study; those who agreed signed the Free and Informed Consent Form. Inclusion criteria were as follows: age between 18 and 75 years; patients submitted to elective cardiac surgery and administered general anesthesia; patients having an ASA classification lower than 5; patients extubated up to 12 hours after the anesthesia effect wore off; patients who did not have any type of allergy to the proposed medication; and patients with adequate comprehension and verbalization skills. The following patients were excluded: those who received neuraxial anesthesia; those who presented with hemodynamic instability, featured by a persistent systolic arterial pressure lower than 90 mmHg, massive hemorrhage, and cardiopulmonary arrest; patients who were re-operated or re-intubated during the data collection period; patients with a previous history of chronic pain; and those discharged from the ICU prior to the completion of the 30-hour extubation period.

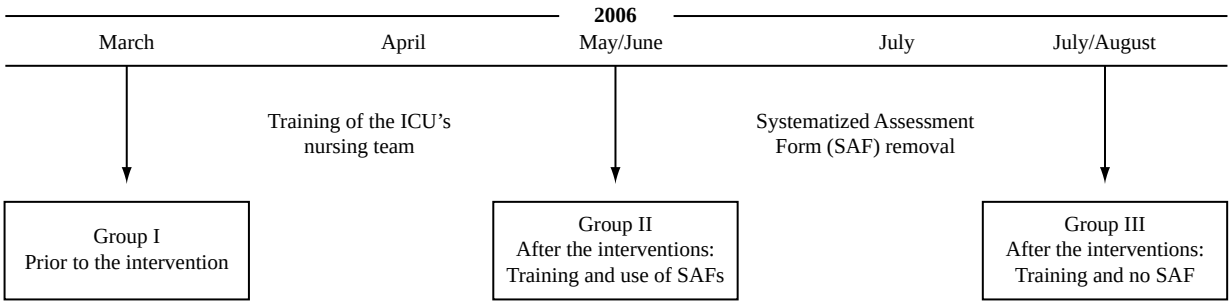

Figure 1 - Study framework

Interventions

Training

To guide the clinical decision-making process regarding the application of supplementary morphine, a specific lecture was delivered on the impact of post-operative pain, pain assessment, the Numerical Rating Pain Scale, the World Health Organization's analgesic step ladder, application of analgesic medication at fixed times and supplementary morphine (*as needed*), as well as procedures for the use of analgesic medication. After the lecture, attending nurses responded to five case studies demanding decision-making processes regarding the administration of supplementary morphine, based on variable data related to the clinical status of the patient. The training program lasted 75 minutes. The entire ICU's nursing team (75 nurses and 105 nursing technicians) participated in small groups comprised of ten professionals per lecture.

Systematized Assessment Form (SAF) for Pain

An SAF for pain was attached to each patient's health record. The document was comprised of three pain assessment items and included blank spaces to be filled out according to pain intensity: at rest, while taking a deep breath and while coughing. A drowsiness assessment was needed to ensure the patient's safety prior to the administration of morphine. The nurses were required to make use of the form every two hours, together with the measurement of vital signs, beginning at the time of the patient's extubation and continuing up to the 30th hour after the surgery. The goal was to encourage nurses to consider the need for adjustments in analgesic prescriptions with the evaluation of pain on a regular basis, according to the established protocol.

Analgesic protocol

The employed analgesic protocol was the one routinely set by the institution, namely: tramadol hydrochloride and dipyrone given at fixed times, as well as morphine sulfate given on an *as needed* basis. A 50 mg tramadol hydrochloride dosage was administered to patients with a maximum weight of 65 kg, and a 100 mg dosage was administered to patients weighing over 65 kg. This administration was interposed with a 30 mg/kg dipyrone dose. Both medications were administered intravenously and followed a fixed 6-hour schedule. A 2 mg intravenous dose of morphine sulfate was administered on an *as needed* basis. Morphine sulfate should be administered to patients displaying the following conditions: pain equal to or higher than 5 (0-10) on the Numeric Pain Rating Scale (NRS), sedation level lower than 4 (1-6) on the Ramsay Sedation Scale (RSS), and systolic blood pressure equal to or higher than 90 mmHg. Fifteen minutes after each administration of the morphine sulfate, the patient should be reassessed regarding pain intensity, level of sedation and systemic blood pressure. This protocol aimed to evaluate pain intensity and provide professionals with a sense of security in terms of administering further dosages of morphine. Once the analgesic titration with morphine was initiated, it should have been interrupted only when a NRS pain score below 5 was reached; sedation was above 3 on the RSS; the systolic blood pressure reading was below 90 mmHg; or any hemodynamic complication or other significant adverse event was present.

Instruments

Pain intensity was assessed using the Numeric Pain Rating Scale (0-10) at rest, while taking a deep breath and while coughing. Drowsiness status was assessed by the Ramsay Sedation Scale (1-6)[13]. The supplementary morphine use and demographic data of the patients, as well as the type of surgery, the physical state defined by the American Society of Anesthesiologists (ASA) and the type of drain were all collected from the patients' health records.

Procedures

All patients scheduled for elective cardiac surgery who met the inclusion criteria were approached by the researcher on the day prior to surgery. Patients who agreed to participate in the study received pre-operative education on pain and its control. Two nurses who did not belong to the institution were specifically trained to provide support during the data collection process, especially on the night shift. After being extubated, patients were visited by either the researcher or the collection assistant at regular 6-hour intervals, up to the 30th hour. This procedure allowed for 6 moments (M) in which each patient

was assessed. These moments were named M1, M2, M3, M4, M5 and M6. The first assessment took place immediately after the extubation of each patient and was named M1. Data regarding the surgery and analgesics were obtained from the patients' records, and pain intensity was described according to their individual reports. It should be noted that the data collected by the researcher regarding pain intensity and sedation took place regardless of the ICU nurse's information record.

The researcher attached the standardized analgesic medical prescription to the charts of all patients in the groups, to ensure homogeneity. The assessment of the patients belonging to Group I occurred in February and March of 2006, before the implementation of the training program and introduction of the SAF. In April, the whole ICU team underwent the training program previously described. Group II was assessed in May and June of 2006 and the form was then attached to the patients' health records. In July and August of 2006, patients belonging to Group III were assessed. The nurses continued to apply the assessment and the *as needed* analgesia protocol but without making use of the form because it was removed to evaluate the effect of the interventions. Figure 1 demonstrates the study framework.

Sample size

Taking into account the greatest difference in morphine use (50% and 20%) among the groups, the sample size was calculated based on a 5% margin of error and 90% power, resulting in an estimated number of 52 patients in each group.

Data analysis

The classification variables are presented in tables comprised of absolute (n) and relative (%) frequencies. The correlation of these variables with the groups was assessed by either the Chi-Square test or the Likelihood Ratio Test. Quantitative variables are descriptively presented in tables composed of average, median, standard deviation and variation (minimum and maximum). The comparison among the groups was made by the Kruskal-Wallis test and the Dunn test was applied to verify achieved differences. All $p< 0.05$ scores were considered statistically significant.

RESULTS

A total of 339 patients were eligible, 157 of which were excluded in compliance with the established criteria. One hundred and eighty-two patients finished the study, generating the following composition for each group: 55 in Group I, 66 in Group II and 61 in Group III. The three groups did not differ regarding the parameters of age, gender, education, type of surgery, type of drain and ASA physical status, which made their comparison possible for the study (Table 1).

Table 1 - Social-demographic characteristics of the patients inserted into the three groups - São Paulo, SP, 2006

Variáveis	GI n = 55		GII n = 66		GIII n = 61		p* value
Age (years)							0,439
Average (SD)	56.5 (11.8)		54.2 (12.1)		56.4 (11.6)		
Median	59.0		54.0		58.0		
Education (years)							0.373
Average (SD)	7.9 (5.4)		8.3 (5.4)		6.8 (4.7)		
Median	7.0		7.5		4.0		
Sex	**N**	**%**	**N**	**%**	**N**	**%**	0.154
Men	32	58.2	47	71.2	34	55.7	
Women	23	41.8	19	28.8	27	44.3	
Surgery	**N**	**%**	**N**	**%**	**N**	**%**	0.256
MR‡	32	58.2	41	62.1	30	49.2	
Valve‡‡	21	38.2	25	37.9	30	49.2	
MR + Valve	02	3.6	00	0.0	01	1.6	
Drain	**N**	**%**	**N**	**%**	**N**	**%**	
Mediastinal	51	92.7	65	98.5	58	95.1	0.297
Right pleural	22	40.0	14	21.2	20	32.8	0.072
Left pleural	33	60.0	37	6.0	38	62.3	0.769
ASA‡‡‡	**N**	**%**	**N**	**%**	**N**	**%**	0.085
1, 2	01	1.8	00	0.0	00	0.0	
3	29	52.7	49	74.2	42	68.9	
4	25	45.5	17	25.8	19	31.1	

‡ Myocardium Revascularization; ‡‡ Valve replacement (aortic or mitral); ‡‡‡ American Society of Anesthesiologists (ASA) physical status classification; * The Kruskal-Wallis test was applied for quantitative variables and the Chi-Square test was applied for categorical variables.

Pain intensity

The Kruskal-Wallis test was performed with the purpose to identify differences between the groups by comparing them two-by-two, using the *Dunn* test. For each group, pain was measured at six moments using the 0-10 numeric pain scale while the patient was at rest, during deep breathing and during coughing. The Kruskal Wallis test showed a significant difference among the groups concerning pain intensity at rest (Table 2) in Moment 2 (p=0.012) and while coughing (Table 3) in Moment 2 (p= 0.021), 3 (p= 0.005), 4 (p= 0.048) and 6 (p= 0.006). According to the Dunn test, Group II presented a lower pain intensity at rest (p= 0.007) and while coughing (p=0.036, p=0.005, p=0.046 and p= 0.011, respectively). Pain with deep breathing was not shown to be different among the groups (Table 3).

Table 2 - Intergroup comparisons (0-10) of pain intensity at rest at all six moments - São Paulo, SP, 2006

Groups	Moments					
	1	2	3	4	5	6
GI						
Average (SD)	4.1(3.6)	3.0(2.9)	1.9(2.5)	1.3(1.8)	1.6(2.3)	1.2(2.1)
Median	5.0	3.0	0.0	0.0	0.0	0.0
GII						
Average (SD)	4.2(3.2)	1.6(2.0)	1.1(2.5)	1.1(1.7)	1.1(2.0)	0.6(1.3)
Median	4.0	0.5	1.0	0.0	0.0	0.0
GIII						
Average (SD)	4.6(3.1)	2.9(2.8)	1.5(1.9)	1.7(2.2)	1.2(1.6)	0.9(1.5)
Median	5.0	2.0	1.0	1.0	0.5	0.0
p*	0.770	0.012	0.603	0.210	0.487	0.293
GIxGII**	--	0.007	0.005	--	--	0.006
GIxGIII**	--	--	--	--	--	--
GIIxGIII**	0.007	--	--	--	--	--

* statistically significant difference produced by the Kruskal Wallis test
** statistically significant difference produced by the Dunn test

Table 3 - Intergroup comparisons (0-10) of pain intensity while taking a deep breath at all six moments - São Paulo, SP, 2006

Groups	Moments					
	1	2	3	4	5	6
GI						
Average (SD)	5.7(3.7)	4.9(3.0)	4.0(2.8)	3.3(2.3)	3.5(2.7)	3.0(2.4)
Median	6.0	5.0	4.0	3.0	3.0	3.0
GII						
Average (SD)	5.3(3.0)	4.0(2.2)	3.0(1.8)	2.7(2.0)	2.4(1.9)	2.1(1.8)
Median	5.0	4.0	3.0	2.0	2.0	2.0
GIII						
Average (SD)	5.9(2.7)	4.2(2.7)	3.9(2.3)	3.8(2.5)	3.2(2.3)	2.6(2.0)
Median	6.0	4.0	4.0	3.0	3.0	2.0
p*	0.491	0.238	0.050	0.063	0.061	0.088
GIxGII**	--	--	--	--	--	--
GIxGIII**	--	--	--	--	--	--
GIIxGIII**	--	--	--	--	--	--

* statistically significant difference produced by the Kruskal Wallis test
** statistically significant difference produced by the Dunn test

It should be noted that the groups had the same basal pain intensity at Moment 1 and that such homogeneity allowed for the deduction that the observed differences were related to the different interventions.

Morphine consumption

Table 5 presents the supplementary morphine consumption data related to each group. Information is

distributed in accordance with the total consumption, number of patients receiving the morphine and number of doses per patient. The study carried out comparisons both among the groups and within each group, showing differences in the number of administered morphine dosages (p=0.002, Kruskal-Wallis test), in the number of patients who received the medication (p=0.002, Chi-Square test) and in the number of dosages per patient (p=0.022, Kruskal-Wallis test). In the two-by-two comparison with the Dunn test (p<0.05), Group II presented a higher morphine consumption than Group I (p=0.006) and Group III (p=0.052). There was no difference in the comparisons between Groups I and III.

Table 4 – Intergroup comparisons (0-10) of pain intensity while coughing at all six moments - São Paulo, SP, 2006

Groups	Moments					
	1	2	3	4	5	6
GI						
Average (SD)	6.3(3.4)	5.5(3.2)	5.1(3.1)	4.3(2.8)	4.2(3.0)	3.8(2.8)
Median	7.0	6.0	4.0	4.0	4.0	4.0
GII						
Average (SD)	5.4(3.2)	4.2(2.5)	3.3(2.1)	3.4(2.1)	2.9(2.1)	2.3(1.9)
Median	5.0	4.0	3.0	3.0	3.0	2.0
GIII						
Average (SD)	6.2(3.0)	5.2(2.7)	4.4(2.6)	4.6(2.7)	3.8(2.4)	3.6(2.4)
Median	7.0	5.0	4.0	4.0	4.0	3.0
p*	0.199	0.021*	0.005*	0.048*	0.050	0.001*
GIxGII**	--	0.036**	0.005**	0.229	--	0.006**
GIxGIII**	--	0.703	0.317	0.641	--	0.813
GIIxGIII**	--	0.087	0.092	0.046**	--	0.011**

* statistically significant difference produced by the Kruskal-Wallis test
** statistically significant difference produced by the Dunn test

Table 5 - Comparison of supplementary morphine dosages and the number of patients who received these dosages in all three Groups - São Paulo, SP, 2006

Consumption of supplementary morphine	GI n= 55		GII n= 66		GIII n= 61		*p*
Total consumption	20		105		50		Kruskal
Average (SD)	0.36(0.82)		1.59(2.04)		0.81(1.69)		Wallis
Median	0		1		0		0.002*
Variation	0 - 4		0 - 9		0 – 9		
Dosage/patient							Kruskal-
Average (SD)	1.66(0.98)		3.0(1.9)		2.27(2.18)		Wallis
Median	1		2		1.5		0.022*
Variation	1 - 4		1 - 9		1 – 9		
	n	**%**	**n**	**%**	**n**	**%**	Chi- Square
Patients using morphine	12	21.8	35	53.0	22	36.1	0.002*

* statistically significant difference

DISCUSSION

The objective of the present study was to determine whether the training program and the use of a systematized assessment form by the nursing team would influence the pain experienced by post-operative cardiac surgery patients. Patients from Group II, whose nursing team had participated in the training program and made use of the Pain Systematized Assessment Form, reported greater pain relief and higher supplementary morphine consumption. When the form was removed, as occurred in Group III, results showed a decline. Patients from Group I, whose nursing team did not attend the training program or use the form, displayed the worst results.

The nursing team that had been adequately trained to assess pain and decide on more appropriate adjustments to the analgesic therapy identified the presence of pain and decided to administer supplementary morphine dosages, thus having a positive effect on analgesia. The similarities in the social-demographic variables, type of surgery and pain intensity in Moment 1 among the groups allow us to affirm that these variables did not influence the observed differences.

One hundred percent of the nursing team that cared for patients from Groups II and III participated in the training program, aiming to demonstrate the observed effect of education on pain and morphine consumption patterns. After the training program, the nursing team showed a more adequate influence on pain control. Although it is impossible to standardize competencies among different professionals, the training program on pain provided basic information toward the most homogeneous and adequate teamwork possible. Another concern was to certify that the same team cared for the patients from all three groups, a feature that was difficult to implement due to days off, work leaves and vacations. The study observed that 86% of nurses and 73.4% of nursing technicians and assistants cared for patients in all three groups, thus showing a satisfactory result.

Pain intensity

Care and rehabilitation activities may trigger pain, especially during the first few post-operative days. Patients reported variable pain intensity with coughing, moving in bed, getting up, taking a deep breath, using a spirometer, and at rest[14]. The measurement of pain at rest, during deep breathing and during coughing resulted from the attempt to analyze the efficacy of the analgesia under different painful stimuli, as the development of post-operative pain control is meant to provide patients with better conditions and reserves to carry out rehabilitation exercises.

Patients from Group II reported less intense pain at rest and while coughing at several assessment moments, indicating a favorable effect of the training intervention and systematized form. Such results are highly desirable because effective coughing is quite important for bronchial hygiene. Therefore, patients from Group II were in better shape to carry out respiratory exercises with regards to pain intensity. The results of this study showed the relevance of assessing pain under different conditions (at rest, while coughing and while taking a deep breath).

The findings of this present study corroborate the results of various authors who note a decline in pain intensity after an educational intervention[10-12] and the use of systematized forms[15-16]. Few studies, however, have assessed the effects of these interventions on pain intensity and on the use of supplementary analgesia in post-operative periods, such as developed by this present research.

A given study observed the effects of a continued educational program for the nursing team and doctors on the assessment and documentation of post-operative pain intensity *at rest* and *at movement*, as well as on analgesic prescriptions. The pain assessment frequency rose from 60% to 88% during this study[16]. Nonetheless, the study did not analyze the impact of the training program on pain intensity.

Authors[17] who applied a two-stage educational intervention showed lower pain intensity in the last 24 hours of the post-operative period. Notwithstanding, they did not observe any difference in pain intensity among patients performing activities such as ambulation, deep breathing and coughing.

Another study assessed the effect of an educational program associated with an analgesia protocol on post-operative pain intensity (at rest, during movement in bed and while coughing) in surgical patients. The authors trained patients, nurses and doctors and observed that the educational program reduced pain (moderate to severe) at rest from 32% to 12%, and decreased pain (moderate to severe) in movement from 37% to 13%[18].

Morphine consumption

At rest, deep breathing and while coughing, pain intensities were less intense in Group II, most likely due to the more frequent use of supplementary morphine. The *as needed basis* morphine was used to analyze whether the identification of a worsening pain scenario would lead the nursing team to a therapeutic adjustment, a feature that was eventually verified. Such data differ from those of a previous study, which observed a lack of reassessment by the nursing team after the analgesic intervention[19]. The sedation degree was one of the previous prerequisite assessment parameters for the administration of the supplementary morphine. It should be noted that the Ramsay sedation scale did not show any difference among the groups of patients (Median=2 in all three groups), indicating that the decision to administer supplementary dosages of morphine was a safe step, as it did not alter the sedation level.

In the present study, nursing staff in Group II assessed pain 16 times in 30 hours, quite an expressive frequency. Group III did not have the SAF for Pain and the evaluation was defined by each professional. As the results in Group III were lower than those observed in Group II, it is assumed that the frequency of assessment, action and reporting behaviors decreased.

It should be highlighted that after removing the SAF, some professionals initially affirmed that they missed the form in their activities, as they had already adapted to the pain assessment and recording routine. Such a complaint, however, did not last long. In patients from Group III, good indicators were lower than those found in Group II, and this fact drew our attention. All employees in this group were trained, similarly to what had happened in Group II; however, they were favored by their experience in the application of the SAF and the analgesic adjustment protocol. Taking such facts into account, the results in Group III seemed to be higher than or equal to those found in Group II, but that was not the case in actuality.

The decline in the patient's improvement observed in Group III was most likely due to the absence of a leitmotif – in this case, the Assessment Form – and also due to the distance from the knowledge acquired in the training program, as this was the last group to be assessed (the

beginning of the collection process took place 42 days after the training program).

A study of the American College Association observed that all knowledge acquired in training programs begins to progressively decline after six months. The same study concluded that whenever the training content is experienced and utilized daily by professionals, the retention time lasts longer. These data support the expectation of better results in Group III[20]. On the other hand, it is believed that the adhesion to an action, idea or behavior can diminish with time.

A study that tested the effects of an educational program on pain aimed at nurses and doctors in medical and surgical units from five general hospitals showed a progressive decline in the nursing team's commitment toward recording pain intensities. The initial adhesion of professionals to carrying out two daily pain assessments in patients and recording printable vital signs results was satisfactory at first; however, it decreased to 59% seven months after the implementation of the educational program[21].

The decrease in the results can be assigned to the lack of the compulsoriness toward assessing and recording pertaining information. The presence of the SAF may have enhanced the professionals' commitment to pain control, allowing them to experience, together with the patients, the investigation routine and pain control, as well as providing greater assurance toward further actions. Additionally, the clinical practice in surgical ICUs, especially concerning high-risk patients, shows that the team is more concerned about the diagnosis and the treatment of other organic dysfunctions than about the issue of pain[22]; such a fact reinforces the relevance of the form for reminding professionals regarding patient pain assessment and the need for an analgesic protocol toward the implementation of the treatment.

The limitation of this present study is that the data collection procedure in all three groups was not a simultaneous and randomized process; because the research took place in a single unit, there was a high risk that patients could be mistakenly mixed among the groups. However, such a limitation does not overrule the strength of the achieved results. It is important to highlight that the procedure for grouping patients did not take samples into account but populations in similar conditions to those found in everyday practices. The uniformity of the groups allowed for comparisons and the achieved results can be attributed to the applied intervention.

The greatest contribution of this study is to note that the active behavior of the nursing team toward adjusting analgesia, encouraged by the training program and the use of the systematized form, ultimately promoted better pain control.

CONCLUSION

The training program and the use of the Systematized Assessment Form for Pain (Group II) constituted a better strategy toward pain control for post-operative cardiac surgery patients, as the interventions increased the employment of supplementary morphine and resulted in lower pain intensity as reported by the patients.

REFERENCES

1. Rond MEJ, Wit R, van Dam FSAM, Mueller MJ. A Pain Monitoring Program for nurses: effect on the administration of analgesics. Pain. 2000;89(1):25-38.
2. Pimenta CAM, Santos EMM, Chaves LDC, Martins LM, Gutierrez BAO. Controle da dor no pós-operatório. Rev Esc Enferm USP. 2001;35(2):180-3.
3. Manias E, Bucknall T, Botti M. Nurses' strategies for managing pain in the postoperative setting. Pain Manag Nurs. 2005;6(1):18-29.
4. Richards J, Hubert AO. Experiences of expert nurses in caring for patients with postoperative pain. Pain Manag Nurs. 2007;8(1):17-24.
5. Cohen F. Postsurgical pain relief: patients' status and nurses' medication choices. Pain. 1980;9(2):265-74.
6. Ferguson J, Gilroy D, Puntillo K. Dimensions of pain and analgesic administration associated with coronary artery bypass grafting in an Australian intensive care unit. J Adv Nurs. 1997;26(6):1065-72.
7. Dihle A, Bjølseth G, Helseth S. The gap between saying and doing in postoperative pain management. J Clin Nurs. 2006;15(4):469-79.
8. Willson H. Factors affecting the administration of analgesia to patients following repair of a fractured hip. J Adv Nurs. 2000;31(5):1145-54.
9. Greer SM, Dalton JA, Carlson J, Youngblood R. Surgical patients' fear of addiction to pain medication: the effect of an educational program for clinicians. Clin J Pain. 2001;17(2):157-64.
10. Rond MEJ, Wit R, van Dam FSAM, Mueller MJ. A pain monitoring program for nurses: effects on communication, assessment and documentation of patients' pain. J Pain Symptom Manage. 2000;20(6):424-39.
11. Ravaud P, Keïta H, Porcher R, Durand-Stocco C, Desmonts JM, Mantz J. Randomized clinical trial to assess the effect of an educational programme designed to improve nurses' assessment and recording of postoperative pain. Br J Surg. 2004;91(6):692-8.

12. Chanques G, Jaber S, Barbotte E, Violet S, Sebbane M, Perrigault PF, et al. Impact of systematic evaluation of pain and agitation in an intensive care unit. Crit Care Med. 2006;34(6):1691-9.

13. Carrasco G. Instruments for monitoring intensive care unit sedation. Critic Care. 2000;4(4):217-25.

14. Milgrom LB, Brooks JA, Qi R, Bunell K, Wuestefeld S, Beckaman D. Pain levels experienced with activities after cardiac surgery. Am J Crit Care. 2004;13(2):116-25.

15. Faries JE, Mills DS, Goldsmith KW, Phillips KD, Orr J. Systematic pain records and their impact on pain control. Cancer Nurs. 1991;14(6):306-13.

16. Karlsten R, Ström K, Gunningberg L. Improving assessment of postoperative pain in surgical wards by education and training. Qual Saf Health Care. 2005;14(5):332-5.

17. Bédard D, Purden MA, Sauvé-Larose N, Certosini C, Schein C. The pain experience of post surgical patients following the implementation of an evidence-based approach. Pain Manag Nurs. 2006;7(3):80-92.

18. Harmer M, Davies KA. The effect of education, assessment and a standardized prescription on postoperative pain management: the value of clinical audit in the establishment of acute pain services. Anaesthesia. 1998;53(5):424-30.

19. Bucknall T, Manias E, Botti M. Nurses'reassessment of postoperative pain after analgesic administration. Clin J Pain. 2007;23(1):1-7.

20. Broomfield R. A quasi-experimental research to investigate the retention of basic cardiopulmonary resuscitation skills and knowledge by qualified nurses following a course in professional development. J Adv Nurs. 1996;23(5):1016-23.

21. Rond M, Wit R, van Dam F. The implementation of a Pain Monitoring Programme for nurses in daily clinical practices: results of a follow-up study in five hospitals. J Adv Nurs. 2001;35(4):590-8.

22. Puntillo K. Pain experiences of intensive care units patients. Heart Lung. 1990; 19(5):526-32.

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Correspondence addressed to: Magda Aparecida dos Santos Silva
Rua Cayowaá, 1210/237
CEP 05018-000 – São Paulo, SP, Brazil